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'GlueX' project gains traction

By Steve Hinnefeld, Herald-Times Staff Writer
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A $45 million project led by Indiana University physicists to learn secrets of the subatomic universe reached a milestone this week with early-stage approval by the U.S. Department of Energy.

Kyle McSlarrow, a deputy secretary of energy, announced the department has established a "mission need" for the project, which is included in a $250 million upgrade of the Continuous Electronic Beam Accelerator Facility at Thomas Jefferson national laboratory in Newport News, Va.

"The mechanism is in place now to make a commitment to really carry the project forward," said Alex Dzierba, an Indiana physics professor and director of the IU-led project, called GlueX. "When they get to this stage, the statement is that they really intend to do it."

Researchers have been working on the project for seven years, and it will be at least another five years before the accelerator expansion is completed and the experiment is producing data for analysis.

The goal is to better understand gluons, charge-bearing particles that bind together subatomic particles called quarks in the protons and neutrons that make up the nucleus of an atom.

Scientists hope to use the upgraded Virginia accelerator — its energy doubled from 6 GeV to 12 GeV, or billion electron volts — to produce never-before-seen particles called exotic mesons. Studying exotic mesons, they believe, will lead to better understanding of confinement, the quality of quarks that says they never exist alone.

The Jefferson Lab expansion got a boost in November 2003 when it was listed as a near-term priority in a 20-year plan for research facilities released by Energy Secretary Spencer Abraham. The plan included 28 facilities, 12 of them near term.

It advanced further this week when McSlarrow signed a "Critical Decision Zero" document, the first of five critical decisions on the project's path.

Dzierba, who was in Virginia this week for the announcement, said the next step is a "nuts-and-bolts review" in which federal officials make sure all the plan's elements are in place. Then design and construction can proceed, contingent on funding.

IU physicists lead a GlueX consortium of more than 100 scientists from two dozen universities in the United States, Australia, Canada, Poland, Russia and Scotland. They are developing methodologies and building equipment, including electronic and robotic devices and sophisticated detectors to chart what happens when subatomic particles are produced by the accelerator beam.

A half-dozen IU professors, scientists and postdoctoral researchers are working in Bloomington on the project, joined by engineering and technical staff, graduate students and even a few undergraduates getting hands-on experience.

"The advantage to having these things done at a university is you can involve undergraduates in the research," Dzierba said. "That's something we're all trying to do."

Project in brief

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